We claim:

1. An insulated barrier comprising:

(a) a first substantially gas impermeable rigid wall;

(b) a second substantially gas impermeable rigid wall;

(c) adjoining portions between said first and second walls that create an entirely closed and substantially hermetically sealed structure; and

(d) a core material between the walls that supports the walls of the structure, comprising a substantially open-cell structure or composition;

wherein said core material is formed *in situ* within said structure. p- by - p

2. An insulated barrier comprising:

(a) a first substantially gas impermeable rigid wall;

(b) a second substantially gas impermeable rigid wall;

(c) adjoining portions between said first and second walls that create an entirely closed and substantially hermetically sealed structure; and

(d) a core material between the walls that supports the walls of the structure, comprising a substantially open-cell structure or composition;

wherein said first substantially gas impermeable rigid wall, said second substantially gas impermeable rigid wall, and said adjoining portions comprise a plastic coated with a metal oxide coating.

3. An insulated barrier comprising:

(a) a first substantially gas impermeable rigid wall;

(b) a second substantially gas impermeable rigid wall;

(c) adjoining portions between said first and second walls that create an entirely closed and substantially hermetically sealed structure; and

(d) a core material between the walls that supports the walls of the structure comprising a substantially closed-cell structure or composition;

wherein said first substantially gas impermeable rigid wall, said second substantially gas impermeable rigid wall, and said adjoining portions comprise a plastic coated with a metal oxide coating; and

wherein said closed-cell structure or composition is a powder or granular, provided that said closed-cell structure or composition is not foam glass.

4. The insulated barrier according to claims 2 or 3, wherein said metal oxide is a silicon oxide.

5. The insulated barrier according to any one of claims 1-3, further comprising a port through which a vacuum may be drawn.

6. The insulated barrier according to any one of claims 1-3, further comprising a vacuum breach sensor within the insulated barrier that detects atmospheric oxygen.

7. The insulated barrier according to claim 5, further comprising a vacuum breach sensor within the insulated barrier that detects atmospheric oxygen.

8. The insulated barrier according to claim 6, wherein said vacuum breach sensor comprises a nonaqueous ionic liquid and an indicator.

9. The insulated barrier according to claim 7, wherein said vacuum breach sensor comprises a nonaqueous ionic liquid and an indicator.

10. The insulated barrier according to claim 1, wherein said first and second walls, and said adjoining portions, comprise a composite of an organic substrate coated with an inorganic matrix.

11. The insulated barrier according to claim 10, wherein said organic substrate is plastic.

12. The insulated barrier according to claim 10 or 11, wherein said inorganic matrix is a metal oxide.

13. The insulated barrier according to claim 12, wherein said metal oxide is a silicon oxide.

14. The insulated barrier according to claim 10, wherein the organic substrate portion of said composite comprises the outside surface of said barrier.

15. The insulated barrier according to claims 1 or 2, wherein said core material is a small pore area material.

16. The insulated barrier according to claim 15, wherein said small pore area material is an organic, small pore area material.

17. The insulated barrier according to claim 15, wherein said small pore area material is a low density microcellular material.

18. The insulated barrier according to claim 16, wherein said organic, small pore area material is a low density microcellular material.

19. The insulated barrier according to claim 17, wherein said low density microcellular material is an aerogel.

20. The insulated barrier according to claim 18, wherein said low density microcellular material is an aerogel.

21. The insulated barrier according to any one of claims 1-3, wherein said core material has a thin film form.

22. The insulated barrier according to claim any one of claims 1-3, wherein said core material has a granular form.

23. The insulated barrier according to claim any one of claims 1-3, wherein said core material has a monolithic form.

24. A process for manufacture of an insulated barrier, comprising the steps of:

(a) providing a substantially gas impermeable enclosure having at least one space or cavity therein and a gas evacuation port;

(b) introducing into said cavity a core material comprising a substantially open-cell structure or composition; and

(c) substantially evacuating said cavity, along with said core material.

25. The process according to claim 24, further comprising the step of compacting said core material prior to evacuation of the cavity.

26. The process according to claim 24, further comprising the step of using said evacuation port for drying the core material.

27. A process for manufacture of an insulated barrier, comprising the steps of:

(a) providing a substantially gas impermeable enclosure having at least one space or cavity therein and a gas evacuation port;

(b) introducing into said cavity a core material comprising a substantially open-cell structure or composition;

(c) placing a substantially gas impermeable capping portion over said gas impermeable enclosure; and

(d) substantially evacuating said cavity, along with said core material.

28. The process according to any one of claims 24, 26 or 27, wherein said cavity contains a vacuum breach sensor comprising a nonaqueous ionic fluid and an indicator.

29. The process according to any one of claims 24, 26 or 27, wherein said substantially gas

impermeable container comprises a composite of an organic substrate coated with an inorganic matrix.

30. The process according to claim 29, wherein said organic substrate is plastic and wherein said inorganic matrix is a metal oxide.

31. The process according to claim 30, wherein said metal oxide is a silicon oxide.

32. A vacuum breach sensor for detecting atmospheric oxygen, comprising a nonaqueous ionic fluid and an indicator.

33. The vacuum breach sensor according to claim 32, wherein said nonaqueous ionic fluid is N-butyl-N'-methylimidazolium chloride.

34. The vacuum breach sensor according to claim 32, wherein said indicator is selected from the group consisting of indigo dyes and thiazine dyes.

35. The vacuum breach sensor according to claim 34, wherein said dye is New Methylene Blue.

36. A vacuum breach sensor for detecting atmospheric oxygen, comprising a zinc oxide battery connected to a light-emitting diode or audible speaker.

37. An insulated barrier comprising a vacuum breach sensor, wherein said vacuum breach sensor is as defined in claims 32 or 36.